AIAA Guidance & Control Challenges to GN&C Education for Next Decade - A Panel Discussion

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Guy K. Man

Jet Propulsion Laboratory

Agenda

. Changing Work Environment

. Engineering Career Options

. Curriculum That Makes a Difference

. Closing Remarks

Changing Work Environment - Clinton/Gore Priorities for Space

- Improve the Economy
  - **Increase Priority of Aeronautics**
  - **Cutting Edge Technology and Transfer**
- NASA and the Environment
  - **EOS**
  - **Focused Environmental Missions**
- NASA and Education
  - **Math and Science Programs**
  - **Expand Outreach**
- Encourage Planetary Exploration
- Maintain Shuttle & Continue Space Station

Changing Work Environment - Goldin's Agenda

. NASA's Budget is Big Enough to Accomplish Much More

. "If He Had His Way" - Change All Big Programs

. Planetary Should be Launched Every Year

. NASA Must Change Its Culture

Changing Work Environment - Goldin's Strategy

- **NASA must foster technological development that leads to industrial competitiveness**
  - Development cycles must be short so technology is still new
  - Programs must be smaller so risk-taking can be done
  - Programs must be cheaper so the public and Congress will see more results
  - Industry must be a partner so technology is used elsewhere

Changing Work Environment

. Develop lower-cost programs

● Incorporate new technologies

. Seek greater linkages with industry

. Fulfill our societal obligations

. Right sizing and be more focused

. Larger role in outreach programs

Engineering Career Options

- **Sales and Management** — **General Engineering**
- **Product Design** — **Hands on and Handbook Applications**
- **Advanced Development** — **Applied Analytical and Hardware skills**
- **Technology and R&D** — **Fundamentals and Innovation**

Different training is required for different career paths.

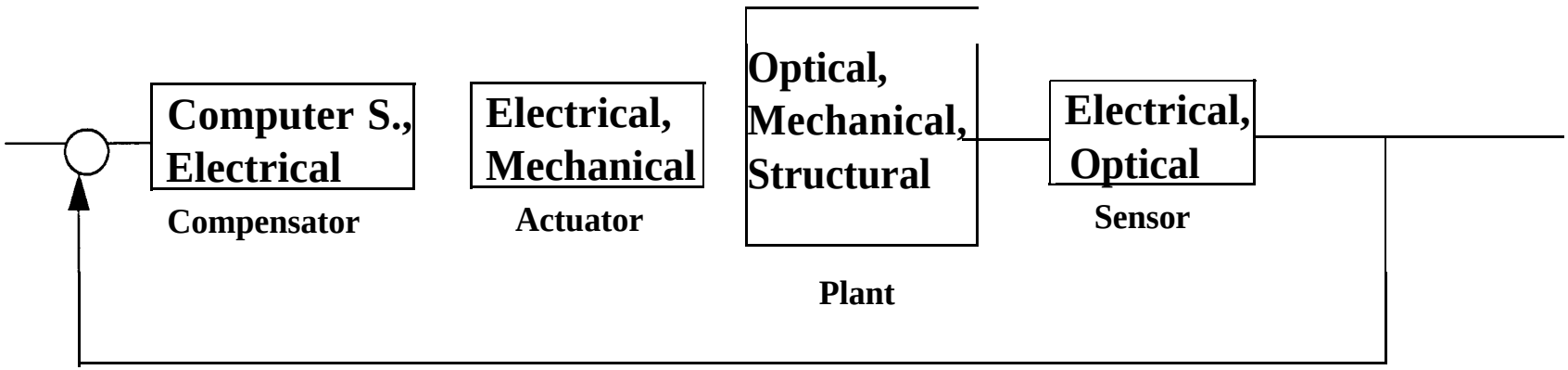
Curriculum That Makes a Difference

- Engineering Fundamentals
  - **more physics (dynamics, optics . ..)**
  - **computer science fundamentals**
  - **numerical analysis & linear algebra**
  - **laboratory (e.g., linear systems, microprocessor, controls)**
- Advanced Speaking and Writing Skills
- Practical Relevance
  - **coop and summer engineering programs**
  - **seminar with industry speakers**
  - **engineering economics**
  - **group projects to solve real world problems:**
    - » **judgments (tolerance to uncertainties)**
    - » **tradeoffs**
    - » **teamwork**

Curriculum That Makes a Difference

. **Multidicipline** training

- **more math, computer science and physics**
- **multidicipline modeling and simulation**



Closing Remarks

. Emphasize depth & breadth on basic trainings

. Nuture competiveness and team work

. Nurture judgments and tolerance to uncertainties

. Ensure economic and social literacy